

What is claimed is:

1. A vacuum apparatus in a papermaking machine, the papermaking machine providing at least a first and a second carrier fabric, said first and second carrier fabrics each having a machine direction and a cross direction perpendicular to the machine direction, in combination a running web adapted for travel in the machine direction, the running web having a width in the cross direction bounded by a first edge and a second edge, the apparatus comprising:

(a) a primary head positioned adjacent to and in fluid communication with the running web,

(b) a primary vacuum box joined to said primary head, the primary vacuum box having on its interior a first region of reduced air pressure, the primary vacuum box extending in the cross direction and adapted for a suction force to said primary head for application to the running web in transferring the running web from the first carrier fabric to the second carrier fabric,

(c) a first auxiliary head positioned downstream from the primary head, said first auxiliary head being positioned adjacent to and in fluid communication with at least the first edge of the running web, and

(d) an auxiliary vacuum box joined to said first auxiliary head, the auxiliary vacuum box having an auxiliary region of reduced air pressure, the auxiliary vacuum box extending in the cross direction and adapted for

applying reduced air pressure to said first auxiliary head for application to at least the first edge of the running web.

2. The vacuum apparatus of claim 1 in which the vacuum apparatus further comprises a second auxiliary head adjacent to and in fluid communication with the second edge of the running web.

3. The vacuum apparatus of claim 1 in which the primary vacuum box extends in the cross direction at least the full width of the running web from the first edge to said second edge.

4. The vacuum apparatus of claim 1 in which the first auxiliary head includes a vacuum slot.

5. The vacuum apparatus of claim 4 in which the vacuum slot of the first auxiliary head is bounded by a first lip and a second lip.

6. The vacuum apparatus of claim 4 in which the vacuum slot is about 1 foot in length in the cross direction.

7. The vacuum apparatus of claim 4 in which the vacuum slot is about 0.75 inches in width in the machine direction.

8. The vacuum apparatus of claim 5 in which the first lip and the second lip form the downstream and upstream boundaries of a vacuum slot.

9. The vacuum apparatus of claim 1 in which the pressure applied from the primary head of the primary vacuum box to the running web is no more than about 8.5 inches of Mercury.

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10. The vacuum apparatus of claim 9 in which the pressure applied is between about 6 inches and about 8.5 inches of Mercury.

11. The vacuum apparatus of claim 1 in which the pressure applied from the primary head of the primary vacuum box to the running web is no more than about 4 inches of Mercury.

12. The vacuum apparatus of claim 1 in which the first carrier fabric includes topographical features.

13. The vacuum apparatus of claim 12 in which the second carrier fabric further comprises topographical features.

14. The vacuum apparatus of claim 1 in which the first region of reduced air pressure and the auxiliary region of reduced air pressure are in fluid communication with each other.

15. The vacuum apparatus of claim 1 in which the first region of reduced air pressure and the auxiliary region of reduced air pressure are not in fluid communication with each other such that said first region and said auxiliary region are capable of applying to the running web differing air pressure values.

16. The vacuum apparatus of claim 1 in which the first auxiliary box is about 15 inches wide in the cross direction.

17. The vacuum apparatus of claim 2 in which a second auxiliary vacuum box is applied to the second edge of the running web.

18. A system for transferring a running web from a first carrier fabric to a second carrier fabric, the system comprising:

5 (a) a running web, the running web having a cross direction extending from a first edge to a second edge, the running web being configured for traveling in a machine direction from an upstream end to a downstream end, the machine direction being perpendicular to the cross direction,

10 (b) a primary head positioned adjacent to and in fluid communication with the running web, the primary head having a primary contact means for application to the running web, the primary contact means extending in the cross direction of the running web, said primary contact means forming a vacuum slot adjacent to the running web,

15 (c) a primary vacuum box joined to said primary head, the primary vacuum box having an interior region of reduced air pressure, the primary vacuum box being adapted for applying reduced air pressure to the vacuum slot of said primary contact means for application to the running web in transferring the running web from the first carrier fabric to the second carrier fabric,

20 (d) a first auxiliary head positioned downstream from said primary head, said first auxiliary head having a first auxiliary contact means extending in the cross direction of the running web and in contact with the running web, said first auxiliary head being provided adjacent to and in fluid communication with the first edge of the running web, and

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(e) a first auxiliary vacuum box joined to said first auxiliary head, the first auxiliary vacuum box having an auxiliary region of reduced air pressure, the first auxiliary vacuum box being adapted for applying said reduced air pressure to a first auxiliary contact means for application to the first edge of the running web.

19. The system of claim 18 in which the first auxiliary contact means further comprises at least one lip extending in the cross direction of the running web.

20. The system of claim 18 in which the pressure applied from the primary head of the primary vacuum box is no more than about 6 inches of Mercury.

21. The system of claim 20 in which said pressure applied is less than about 1 inch of Mercury.

22. The system of claim 18 in which a second auxiliary vacuum box is applied to the running web.

23. An apparatus for adhering a running web upon the surface of a carrier fabric in a papermaking process, the apparatus comprising:

(a) a running web, the running web having a cross direction extending from a first edge to a second edge, the running web being configured for traveling in a machine direction from an upstream end to a downstream end, the machine direction being perpendicular to the cross direction,

(b) an auxiliary head extending in the cross direction of the running web and in contact with the running web, said auxiliary head being provided adjacent to and in fluid communication with the first edge of the running web, and

(c) an auxiliary vacuum box joined to said first auxiliary head, the auxiliary vacuum box having an auxiliary region of reduced air pressure, the auxiliary vacuum box being adapted for applying said reduced air pressure to the first edge of the running web to adhere the running web to a carrier fabric.

24. The apparatus of claim 23 in which the auxiliary contact head further comprises at least one lip extending in the cross direction of the running web.

25. The apparatus of claim 23 in which the air pressure applied is no more than about 4 inches of Mercury.

26. The apparatus of claim 25 in which the pressure applied is less than about 1 inch of Mercury.

27. A process for manufacturing paper from a web, in a papermaking machine, the web having a width in the cross direction, the web being bounded by a first edge and a second edge, the process being adapted for transferring the web from at least a first carrier fabric to a second carrier fabric, comprising:

(a) applying a first suction force at a first point on the web, the first suction force being applied across substantially the full cross directional width of the web, initiating transfer of the web from the first carrier fabric,

(b) applying a second suction force to the web at a second point, wherein the second point is located downstream from the first point, the second suction force being applied upon at least upon the first and second edges of the web, and

(c) completing transfer the web from a first carrier fabric to a second carrier fabric.

28. The process of claim 27 in which the second suction force applied is no more than about 4 inches of Mercury.

29. The process of claim 27 in which the second suction force applied is less than about 1 inch of Mercury.

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